

[Jan 12, 1952] orig to EFK. in person

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PROGRESS REPORT

Release of Sterilized Screw-worm Flies on Sanibel Island, Florida

R. C. Bushland
Kerrville, Texas

Beginning in November work was started at Sanibel Island; locations were selected for three goat pens and six status traps. All the work of establishing the experimental facilities was completed during the month.

On December 5 the first release of flies was made on the island. Flies emerged (about 50 percent) over a 2-day period from 7,500 x-rayed and from 1,500 normal pupae. Since that time releases have been made at 2-week intervals, using a 5 to 1 ratio between sterilized and normal insects. During December 21-23, flies emerged from 13,000 x-rayed and 2,600 normal pupae. Emergence was estimated to be only 28 percent, thus approximately 3,600 sterilized flies and 730 normal flies emerged.

All the released flies were from larvae reared in a P-32 medium by R. D. Radeleff. His prior experiments and counting rates taken on cultures shipped for release indicate that during normal adult life the flies and their egg masses were sufficiently radioactive to be positively identified by the field monitor used at Sanibel.

In each of the three goat pens on Sanibel Island 15 goats are kept. Three goats in each pen are infested each week with screw-worms which are destroyed with benzol on the last day of development. Thus there are always at least 9 wounds to attract ovipositing flies.

Beginning December 11, when the first released flies were 6 days old and theoretically capable of ovipositing, the egg masses were checked with a Geiger counter. The masses were removed from the wounds and held on moist paper in petri dishes for observations on hatching.

It is assumed that during the period December 11-23 flies from the first release could have deposited egg masses. Data on 56 egg masses checked during that time were:

Radioactive - infertile -	2
fertile -	9

Normal infertile-	10
fertile -	35

There was an indicated ratio of 11 released fertile flies to 45 wild flies. Since the sterilized-fertile ratio among released flies was 5-1, the following population ratio might be assumed - sterile - 55, normal released - 11 and normal wild - 45 or 55 sterile to 56 normal. If that ratio existed, theoretically half the normal released flies should have mated with sterilized males and laid infertile eggs. Actually, only two of eleven eggs were infertile.

Orig to C.F.K. in Bureau
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Beginning in November work was started at Sanibel Island; locations were selected for three goat pens and six status traps. All the work of establishing the experimental facilities was completed during the month.

On December 5 the first release of flies was made on the island. Flies emerged (about 50 percent) over a 3-day period from 7,500 x-rayed and from 1,500 normal pupae. Since that time releases have been made at 2-week intervals, using a 5 to 1 ratio between sterilized and normal insects. During December 11-23, flies emerged from 13,000 x-rayed and 2,600 normal pupae. Emergence was estimated to be only 38 percent, thus approximately 5,000 sterilized flies and 730 normal flies emerged.

All the released flies were from larvae reared in a P-32 medium by R. D. Radcliffe. His prior experiments and counting rates taken on only three shipped for release indicate that during normal adult life the flies and their egg masses were sufficiently radioactive to be positively identified by the field monitor used at Sanibel.

In each of the three goat pens on Sanibel Island 15 goats are kept. Three goats in each pen are infested each week with screw-worms which are destroyed with benzol on the last day of development. Thus there are always at least 3 wounds to attract ovipositing flies.

Beginning December 11, when the first released flies were 6 days old and theoretically capable of ovipositing, the egg masses were checked with a Geiger counter. The masses were removed from the wounds and held on moist paper in petri dishes for observations on hatching.

It is assumed that during the period December 11-23 flies from the first release could have deposited egg masses. Data on 56 egg masses checked during that time were:

Radioactive - infertile	- 3
fertile	- 9
Normal	
infertile	- 10
fertile	- 35

There was an indicated ratio of 11 released fertile flies to 45 wild flies. Since the sterilized-fertile ratio among released flies was 2-1, the following population ratio might be assumed - sterile - 55, normal released - 11 and normal wild - 45 or 55 sterile to 55 normal. If that ratio existed, theoretically half the normal released flies should have mated with sterilized males and laid infertile eggs. Actually, only two of eleven eggs were infertile.

The flies released December 21-23 could have begun ovipositing by December 29, and by that time flies from the first release should have largely disappeared. From December 29 through January 3, 45 masses were found on the trap wounds. Data were as follows:

Radioactive	- infertile	- 19
	fertile	- 10
Normal	infertile	- 5
	fertile	- 11

It was indicated by egg masses collected during this 6-day period that the ratio between radioactive released and normal wild flies was 29 to 16. As there were 5 times as many sterile flies released, the ratio between sterile and normal flies might be estimated at 145 to 45. Since sterile insects theoretically outnumbered normal insects about 3-1, it might be expected that about three-fourths of the released normal females should lay infertile eggs. Actually, two-thirds of the egg masses were infertile.

Combining the data on egg masses following the two releases, the statistics are as follows:

Radioactive	- infertile	- 21
	fertile	- 19
Normal	- infertile	- 15
	fertile	- 46

The indicated population ratio was 40 normal released to 61 normal wild flies. As there were 5 times as many sterile as normal flies released, the indicated ratio for the island fly population during this period was 200 sterile to 101 normal.

In the 1950 cage tests on mixed populations we evaluated such a 2-1 ratio. Cages were set up with 10 normal males, 10 normal females, 20 sterile males and 20 sterile females. From a total of 7 such cages, 45 egg masses were obtained, of which 19 hatched and 26 were infertile. Therefore, the field observations on Sanibel with a theoretical 2-1 ratio seem to confirm the earlier observations on cage populations with that ratio.

The egg fertility data so far obtained are too limited for definite conclusions, being based on only forty egg masses laid by released flies. No conclusions can be drawn from the data on the sixty-one egg masses laid by wild flies, as we cannot know how many may have mated before migrating to Sanibel Island. It is encouraging that fifteen of those sixty-one masses were infertile.

In selecting Sanibel Island it was hoped that the site was sufficiently isolated that wild screw-worm flies would not be numerous enough to interfere with the experiment. It now seems that the best course may be to release more flies at more frequent intervals.

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